Claims:

1. A liquid crystal device comprising a layer of a liquid crystal material contained between two spaced cell wall carrying electrodes structures and an alignment treatment on at least one wall,

characterised by

means for reducing anchoring energy at the surface alignment on one or both cell walls.

2. The device of claim 1 wherein the means for reducing energy is an oligomer or short chain polymer within the liquid crystal material at the cell walls.

3. The device of claim 1 wherein the means for reducing energy is an oligomer containing esters, thiols, and/or acrylate monomers within the liquid crystal material at the cell walls.

4. The device of claim 2 wherein the oligomer or short chain polymer has imperfect solubility in the liquid crystal material.

5. The device of claim 2 wherein the oligomer or short chain polymer has a physical affinity for the surface of the cell wall.

6. The device of claim 2 wherein the oligomer or short chain polymer retains a substantially liquid like surface at the polymer and liquid crystal material interface

7. The device of claim 2 wherein the oligomer or polymer is substantially non-crystalline within the liquid crystal material.

8. The device of claim 2 wherein the oligomer or polymer reduces the liquid crystal material order parameter at or adjacent the cell walls.

9. The device of claim 2 wherein the oligomer or polymer changes the phase of the liquid crystal material at or adjacent the cell walls.

10. The device of claim 2 wherein the oligomer or polymer has a glass transition temperature below the operating temperature range of the device.

11. The device of claim 2 wherein the oligomer or polymer is substantially linear or includes branch points, either with or without crosslinking.

12. The device of claim 2 wherein the oligomer or polymer has a number of repeat units within the range of 4 to 1000.

13. A method of making a liquid crystal device comprising the steps of:-

providing a layer of a liquid crystal material contained between two spaced cell wall carrying electrodes structures and an alignment treatment on at least one wall,

characterised by

the step of reducing anchoring energy at the surface alignment on one or both cell walls.

14. The method of claim 11 wherein the oligomer or short chain polymer is formed by polymerisation of reactive low molecular weight materials in solution in the liquid crystal fluid.

15. The method of claim 11 wherein the oligomer or short chain polymer is formed by polymerisation of reactive low molecular weight materials in solution in the liquid crystal material prior to its introduction between the cell walls.

16. The method of claim 11 wherein the oligomer or short chain polymer is formed by polymerisation of reactive low molecular weight materials in solution in the liquid crystal material after to its introduction between the cell walls.

17. The method of claim 11 wherein the oligomer or short chain polymer is formed by polymerisation of reactive low molecular weight materials in the presence of an inert solvent which is then removed and the resulting polymer dissolved in the liquid crystal material prior to its introduction between the cell walls.

18. A twisted nematic liquid crystal device capable of being switched from a twisted stated to a non twisted state comprising;

two cell walls enclosing a layer of nematic liquid crystal material;

electrode structures on both walls for applying an electric field across the liquid crystal layer;

a surface alignment on both cell walls providing alignment direction to liquid crystal molecules and arranged so that a twisted nematic structure is formed across the liquid crystal layer;

means for distinguishing between the two different optical states of the liquid crystal material;

CHARACTERISED BY

means for reducing zenithal anchoring energy in the surface alignment on one or both cell walls.

19. The device of claim 18 wherein the means for reducing zenithal anchoring energy is an oligomer which is coated onto the inner surface of one or both cell walls either spread on the surface or added to the liquid crystal material.

20. The device of claim 18 wherein the means for reducing and zenithal anchoring energy is an oligomer incorporated in the liquid crystal material.

21. The device of claim 18 wherein the means for reducing zenithal anchoring energy is N65, or MMXM035.

22. The device of claim 18 wherein the means for reducing zenithal anchoring energy is a material containing esters, thiols, and/or acrylate monomers.

23. The device of claim 18 wherein the means for reducing zenithal anchoring energy reduces the liquid crystal material order parameter at or adjacent the cell walls.

24. The device of claim 18 wherein the means for reducing zenithal anchoring energy changes the phase of the liquid crystal material at or adjacent the cell walls.

25. The device of claim 18 including means for reducing azimthal anchoring energy.

26. The device of claim 18 wherein the surface alignment provides a pretilted nematic alignment on both cell walls.

27. The device of claim 18 wherein the surface alignment is provided by a rubbed polymer, a photo-ordered polymer or an obliquely evaporated inorganic material.

28. The device of claim 18 wherein the surface alignment layer is a surface monograting with an asymmetric groove profile.

29. The device of claim 18 wherein the alignment directions on the two surface are substantially perpendicular.

30. The device of claim 18 wherein the liquid crystal director twists by about 90° throughout the thickness of the cell.

31. The device of claim 18 wherein the liquid crystal director twists is greater than 180° and less than 360°.

32. The device of claim 18 wherein the nematic liquid crystal material contains a small amount (<5%) of a chiral dopant material.

33. A bistable nematic liquid crystal device capable of being switched into two different stable states comprising

two cell walls enclosing a layer of nematic liquid crystal material;

electrode structures on both walls;

a surface alignment on one or both cell walls providing two alignment directions to liquid crystal molecules with an amount of surface pretilt;

means for distinguishing between switched states of the liquid crystal material;

CHARACTERISED BY

means for reducing inelastic azimuthal memory anchoring energy in the surface alignment on one or both cell walls.

34. The device of claim 33 and including means for reducing zenithal anchoring energy

35. The device of claim 33 wherein the means for reducing the anchoring energy is an oligomer or short chain polymer which is either spread on the surface or added to the liquid crystal material.

36. The device of claim 35 wherein the oligomer is a material selected from:

Norland N65

$-\left[S(CH_2)_6 S\, CH_2CH_2O(CH_2)_6 O\, CH_2CH_2\right]_n -$

$CH_2 = CH\ O(CH_2)_6O\ CH{=}CH_2$ HDVE (Hexane -1,6-diol di(vinyl ether)

CH_2 =$CHOC_4H_9$	BVE (Butyl vinyl ether)
$HSCH_2CO_2(CH_2)_2OCOCH\ S_2H$	EGTG (Ethylene glycol bis(thioglycollate))
$HS(CH_2)_9SH$	NDT (Nonane-1,9-dithiol)

37. The device of claim 35 wherein the oligomer is an amount up to 10.% by weight in the liquid crystal material.

38. The device of claim 35 wherein the chain length (n) is less than 100 repeat units.

39. The device of claim 35 wherein the oligomer's parameters of type, concentration, chain length, are arranged to reduce the liquid crystal order parameter at or adjacent the cell wall.

40. The device of claim 35 wherein the ologomer's parameters of type, concentration, chain length, are arranged to change the phase of the liquid crystal material at or adjacent the cell wall.

41. The device of claim 35 wherein the oligomer is a material is a material that has been precured prior to introduction between the cell walls.

42. The device of claim 35 wherein the oligomer is a material that has been precured after introduction between the cell walls.

43. The device of claim 33 wherein the surface alignment is provided by a bigrating surface.

44. A smectic liquid crystal device comprising:

a liquid crystal cell including a layer of smectic liquid crystal material contained between two walls bearing electrodes and surface treated to give both an alignment and a surface tilt to liquid crystal molecules;

CHARACTERISED BY

means for reducing anchoring energy at the surface alignment on one or both cell walls.

45. The device of claim 44 wherein the means for reducing energy is an oligomer or short chain polymer within the liquid crystal material at the cell walls.

46. The device of claim 44 wherein the means for reducing energy is an oligomer containing esters, thiols, and/or acrylate monomers within the liquid crystal material at the cell walls.

47. The device of claim 45 wherein the oligomer or short chain polymer has imperfect solubility in the liquid crystal material.

48. The device of claim 45 wherein the oligomer or short chain polymer has a physical affinity for the surface of the cell wall.

49. The device of claim 45 wherein the oligomer or short chain polymer retains a substantially liquid like surface at the polymer and liquid crystal material interface

50. The device of claim 45 wherein the oligomer or polymer is substantially non-crystalline within the liquid crystal material.

51. The device of claim 44 wherein the oligomer or polymer reduces the liquid crystal material order parameter at or adjacent the cell walls.

52. The device of claim 44 wherein the oligomer or polymer changes the phase of the liquid crystal material at or adjacent the cell walls.

53. The device of claim 44 wherein the liquid crystal material is a chiral smectic material, the alignment directions on the two cell walls are substantially parallel, and the device is a bistable device.

54. The device of claim 44 wherein the alignment directions on the two cell walls are non parallel.

55. The device of claim 44 wherein the liquid crystal material is a non-chiral smectic material.

56. The device of claim 44 wherein the liquid crystal material is a smectic A material.

57. The device of claim 44 wherein the alignment is provided by a grating surface.

58. The device of claim 44 wherein the alignment is provided by a rubbed polymer surface.

59. The device of claim 44 wherein one cell wall has an alignment treatment, the other cell wall has no azimuthal alignment direction, and both cell walls are treated with the means for reducing anchoring energy.